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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/508,882	04/25/2005	Paul S Prevey	LRI-007FORus	8111
45245	7590	03/20/2007	EXAMINER	
SCOTT EVANS 1252 COUNTRY HILLS DR. SANTA ANA, CA 92705			ABOAGYE, MICHAEL	
			ART UNIT	PAPER NUMBER
			1725	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/20/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/508,882	PREVEY, PAUL S	
	Examiner	Art Unit	
	Michael Aboagye	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09/21/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Objections*

1. Claim 7 is objected to because of the following informalities: at the end of lines 2, it is suggested the limitation "a desired residual stress Pattern" should be replaced with "a desired compressive stress". Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1,4-11 and 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Offer (US Patent No. 5,688,419).

Regarding claims 1, 9, 10 and 11, Offer teaches a method of forming a weld joint comprising the steps of: performing a welding operation along a weld line to form a weld joint and heated regions along the surfaces of the workpieces (figures 1C & 5; column

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3, lines 55-60); and performing a compression operation to induce a layer of compression over a wider axial length on the surfaces of the workpieces (column 8, lines 37-40); wherein the welding operation forms regions having an elevated surface temperature and creating a temperature gradient within a regions of the workpices (column 8, lines 13-17); and wherein the compression operation is performed along the weld line and regions having an elevated surface temperature (column 3, lines 55-60 and column 9, lines 51-55, and figure 5).

Regarding claims 4, 5, 6, 15 and 16, Offer teaches a process of inducing a layer of compression over a wider axial length on the surface of the workpieces using a burnishing process to control the residual stress pattern (abstract, column 4, lines 46-55 and column 11, lines 1-90), (note the oscillating mode of the welding tool which induces the compression in the workpieces is interpreted by the examiner as rubbing which synonymous to burnishing). Offer also teaches a single pas compression operation (column 3, lines 61-64, column 4, lines 39-40 and 46-47).

4. Claims 1, 11, 17, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Hagen (US Patent No. 5,201,458):

Regarding claims 1, and 11, Hagen teaches a method of forming a weld joint comprising the steps of: performing a welding operation along a weld line to form a weld joint and heated regions along the surfaces of the workpieces; and performing a compression operation to induce a deep layer of compression in the surfaces of the workpieces (column 7, lines 52-60); wherein the welding operation forms regions having an elevated surface temperature; and wherein the compression operation is performed

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along the weld line and regions having an elevated surface temperature (column 3, lines 46-54, and column 8, lines 46-61).

Regarding claims 17, 18 and 22, Hagen teaches an apparatus for forming a weld joint, the apparatus comprising: means for heating (column 5, lines 19-21) and performing a welding operation to weld at least two workpieces together; and means for inducing a deep layer of compression within the surface of the workpieces (see "70", figure 8, and column 7, lines 22-43); wherein said means for performing the welding operation by laser welding (column 3, lines 46-54 and column 7, lines 2-8 and 52-60). Hagen also teaches preheating the material in the area of the weld spots prior to welding and also creating a surface temperature gradient ("46", figures 8-9C, and column 8, lines 46-61).

5. Claims 1- 8 are rejected under 35 U.S.C. 102(e) as being anticipated by James et al. (US Patent No. 6,926,970).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 1, 6, 10 and 16 James et al. teaches a method of forming a weld joint comprising the steps of: performing a welding operation along a weld line to form a weld joint and heated regions along the surfaces of the workpieces; and

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performing a compression operation to induce a deep layer of compression in the surfaces of the workpieces in a predetermined pattern; wherein the welding operation forms regions having an elevated surface temperature; and wherein the compression operation is performed along the weld line and regions having an elevated surface temperature in a single pass (abstract, column 8, line 50 –column 9, line 4, column 11, lines 33-40).

Regarding claims 2 and 3, James et al. teaches wherein the amount of surface cold working is less than about 2 percent, and wherein the amount of surface cold working is less than about 5 percent (column 4, lines 34-46 and 60-65).

Regarding claims 4, James et al. teaches inducing a deep layer of compression is performed using a burnishing process (column 5, lines 25-30).

Regarding claim 7, James et al. further teaches varying the amount of surface cold working to achieve a desired compressive stress pattern and surface hardening (figure 7 and column 11, lines 12-23).

6. Claims 17, 19, 20 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by James et al. (US Patent No. 6,926,970).

James et al. teaches an apparatus for forming a weld joint, the apparatus comprising: means for performing a welding operation to weld at least two workpieces together; and means for inducing a deep layer of compression within the surface of the workpieces column 8, lines 50-67); wherein said means for performing the welding operation is selected from the group consisting of gas welding, arc welding, resistance welding, thermite welding, laser welding, and electron-beam welding ( column 5, lines

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17-22 and column 11, lines 3-8); means for inducing a deep layer of compression within the surface of the weld joint comprises a burnishing device; a controller for automatically controlling the movement of said welding tool and the compression tool (column 9, lines 30-67 and "116", figure 2). James et al. further teaches means for heating selected regions of the surfaces of the workpieces (column 8, lines 40-49).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over James et al. (US Patent No. 6,926,970) as applied to claim 1 above and in view of Yoshida et al. (US Patent No 4,588,869).

James et al. does not expressly teach creating a temperature gradient within a region of the workpiece, or a coolant to cool a region of the workpieces.

However, Yoshida et al. teaches a method and an apparatus for relieving residual stresses in a butt welding joint, by heating the outer surface of the joint under predetermined conditions and using a coolant such as water or air (Yoshida et al., column 4, lines 27-31) to cool a selected portions of the workpiece to create a temperature gradient and inducing compressive stress at said portions to relieve the residual stresses (Yoshida et al. abstract, column 1, lines 19-24, and lines 44-51).

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It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to use using a coolant such as water or air (Yoshida et al., column 4, lines 27-31) to cool a selected portions of the workpiece in the method of James et al. as taught by Yoshida to cool said selected portions of the workpiece to create a temperature gradient and inducing compressive stress at said portions to relieve the residual stresses (Yoshida et al. abstract, column 1, lines 19-24, and lines 44-51).

9. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over James et al. (US Patent No. 6,926,970) in view of Yoshida et al. (US Patent No. 4,588,869).

James et al. teaches a method of forming a weld joint comprising the steps of: performing a welding operation along a weld line to form a weld joint and heated regions along the surfaces of the workpieces; and performing a compression operation to induce a deep layer of compression in the surfaces of the workpieces in a predetermined pattern; wherein the welding operation forms regions having an elevated surface temperature (column 11, line 57-column 12, line 2); wherein the compression operation is performed along the weld line and regions having an elevated surface temperature in a single pass (abstract, column 8, line 50 –column 9, line 4, column 11, lines 33-40); wherein the amount of surface cold working is less than about 2 percent, and wherein the amount of surface cold working is less than about 5 percent (column 4, lines 34-46 and 60-65).



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James et al. does not expressly teach creating a temperature gradient within a region of the workpiece, or a coolant to cool a region of the workpieces.

However, Yoshida et al. teaches a method and an apparatus for relieving residual stresses in a butt welding joint, by heating the outer surface of the joint under predetermined conditions and using a coolant such as water or air (Yoshida et al., column 4, lines 27-31) to cool a selected portions of the workpiece to create a temperature gradient and inducing compressive stress at said portions to relieve the residual stresses (Yoshida et al. abstract, column 1, lines 19-24, and lines 44-51).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to use using a coolant such as water or air (Yoshida et al., column 4, lines 27-31) to cool a selected portions of the workpiece in the method of James et al. as taught by Yoshida to cool said selected portions of the workpiece to create a temperature gradient and inducing compressive stress at said portions to relieve the residual stresses (Yoshida et al. abstract, column 1, lines 19-24, and lines 44-51).

10. Claims 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over James et al. (US Patent No. 6,926,970) as applied to claim 17 above and in view of Yoshida et al. (US Patent No. 4,588,869).

James et al. does not expressly teach creating a temperature gradient within a region of the workpiece, or a coolant to cool a region of the workpieces.

However, Yoshida et al. teaches a method and an apparatus for relieving residual stresses in a butt welding joint, by heating the outer surface of the joint under

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predetermined conditions and using a coolant such as water or air (Yoshida et al., column 4, lines 27-31) to cool a selected portions of the workpiece to create a temperature gradient and inducing compressive stress at said portions to relieve the residual stresses (Yoshida et al. abstract, column 1, lines 19-24, and lines 44-51).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to use using a coolant such as water or air (Yoshida et al., column 4, lines 27-31) to cool a selected portions of the workpiece in the method of James et al. as taught by Yoshida to cool said selected portions of the workpiece to create a temperature gradient and inducing compressive stress at said portions to relieve the residual stresses (Yoshida et al. abstract, column 1, lines 19-24, and lines 44-51).

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tsujimura (US 5,022,936), Tsujimura (US 5,494,539), Prime (US 6,470,756), Pechersky (US 5,432,595) and Thompson et al. (US 4,248,095) are also cited in PTO-892.


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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AM

  
JONATHAN JOHNSON  
PRIMARY EXAMINER

  
Michael Aboagye  
Assistant Examiner  
Art Unit 1725

03/16/2007